

What is claimed is:

1 1. Methods for the production of mixed alcohols including the steps of:  
2 using a sulfided, nanosized transition metal catalyst selected from Group VI metals;  
3 nanosizing the Group VI transition metal catalyst;  
4 suspending the catalyst in a solvent to form a slurry;  
5 contacting said slurry with gases including carbon monoxide and hydrogen at a  
6 temperature in the range of about 250 to about 325°C and at a pressure in the range of about 500  
7 to about 3000 psig, to thereby produce mixed alcohols.

1 2. The method of claim 1 wherein the nanosized Group VI transition metal catalysts is  
2 sulfided prior to its use in producing mixed alcohols from gases including carbon monoxide and  
3 hydrogen.

1 3. Nanosized Group VI transition metal catalysts for use in producing mixed alcohols from  
2 gases including carbon monoxide and hydrogen.

1 4. The nanosized Group VI transition metal catalysts of claim 3 including sulfur

1 5. All methods for the production of mixed alcohols taught herein.

1 6. All catalysts for the production of mixed alcohols taught herein.